(12) AUSTRALIAN PATENT ABRIDGMENT
(FOLLOWING MODIFIED EXAMINATION
BASED ON US PATENT NO. 4478094)

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(54) LIQUID SAMPLE HANDLING SYSTEM

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(57) Claim

1. A machine for automatically transferring at least a portion of liquid sample from one or more liquid-containing receptacles to one or more other receptacles, comprising:
a head assembly translatable between upper and lower positions along a vertical axis;
means for moving said head assembly along said vertical axis;
a plunger assembly mounted on said head assembly for movement therewith, said plunger assembly including a row of pipettes having depending ends for receiving tips, a row of plungers respectively disposed within said pipettes, and means for moving said plungers within said pipettes to vary their internal volumes;
tip ejector means mounted on said head assembly for removing tips disposed on said depending ends of said pipettes;
a table mounted beneath said head for translation along a

.../2

horizontal axis, said table having work stations spaced along said axis for respectively accommodating a tray having pipette tip-receiving receptacles and one or more trays providing said liquid-containing receptacles and other receptacles;
means for moving said table along said horizontal axis to place any selected one of the receptacles in registry with said pipettes; and
means for controlling each of said moving means for said head assembly, plungers and table and said tip ejector means to effect transfer of liquid between the liquid-containing receptacles and the other receptacles and to replace tips on the ends of said pipettes with other tips disposed in at least some of the pipette tip-receiving receptacles between predetermined liquid transfer steps.

13. A method for effecting automatic transfer or dilution of liquid samples between a plurality of liquid receptacles positioned for horizontal movement on a support table and being indexable beneath a vertically movable row of pipettes, comprising the steps of:

(a) charging a predetermined volume of a first liquid into one or more receptacles located at a first work station on said table;
(b) arranging at least a row of pipette tips at a second work station on said table;
(c) moving said table to register said row of pipette tips with the row of pipettes;
(d) lowering said pipettes to engage the tips in said registered row and picking up the engaged tips;
(e) moving said table to register the receptacles of said first work station with said row of pipettes;
(f) inserting the engaged tips in the first liquid in said registered receptacles and withdrawing at least least some of the liquid therefrom into said pipettes;
(g) raising said pipettes;
(h) moving said table to register other receptacles with said pipettes;

.../3

(i) lowering said pipettes and expelling the liquid in said pipettes into the other receptacles;

(j) raising said pipettes;

(k) moving the table to bring a selected position at said second work station into alignment with said pipettes;

(l) discharging said engaged tips from said pipettes; and

(m) repeating steps b through k until a desired number of transfers of dilutions are completed.